

1/12

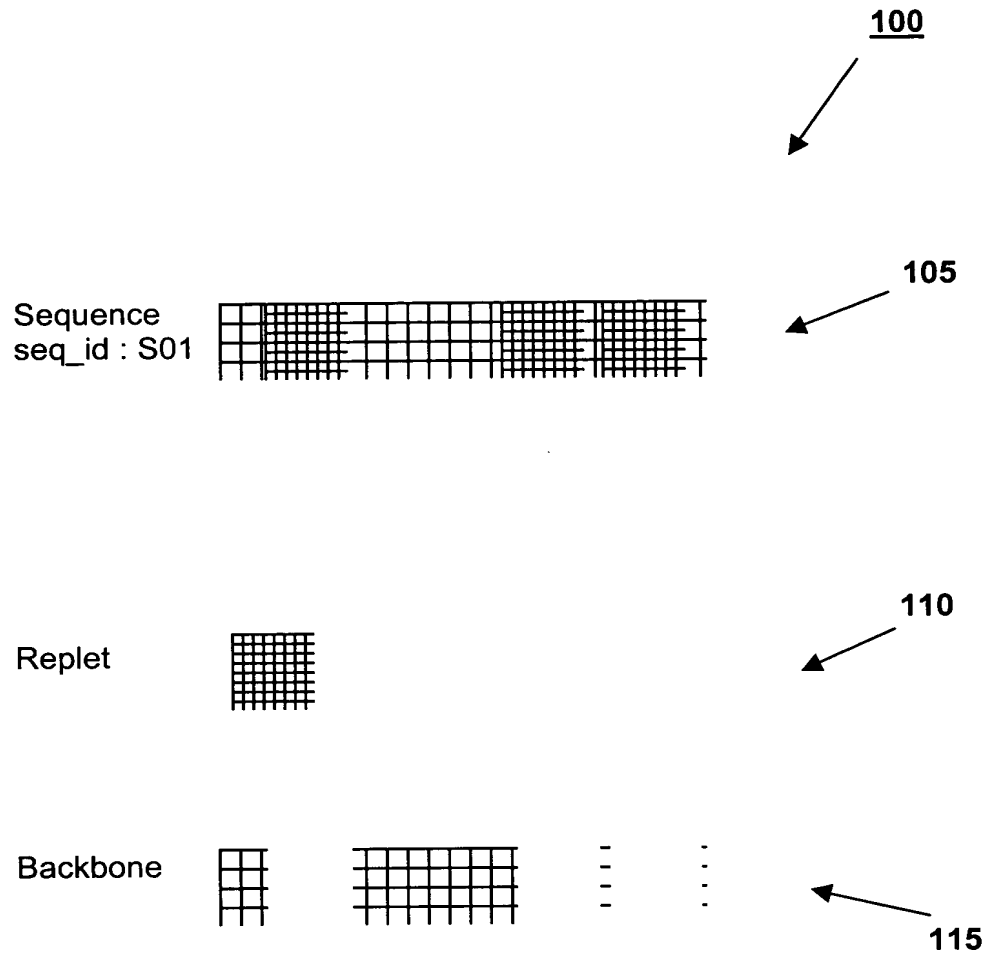


FIG. 1

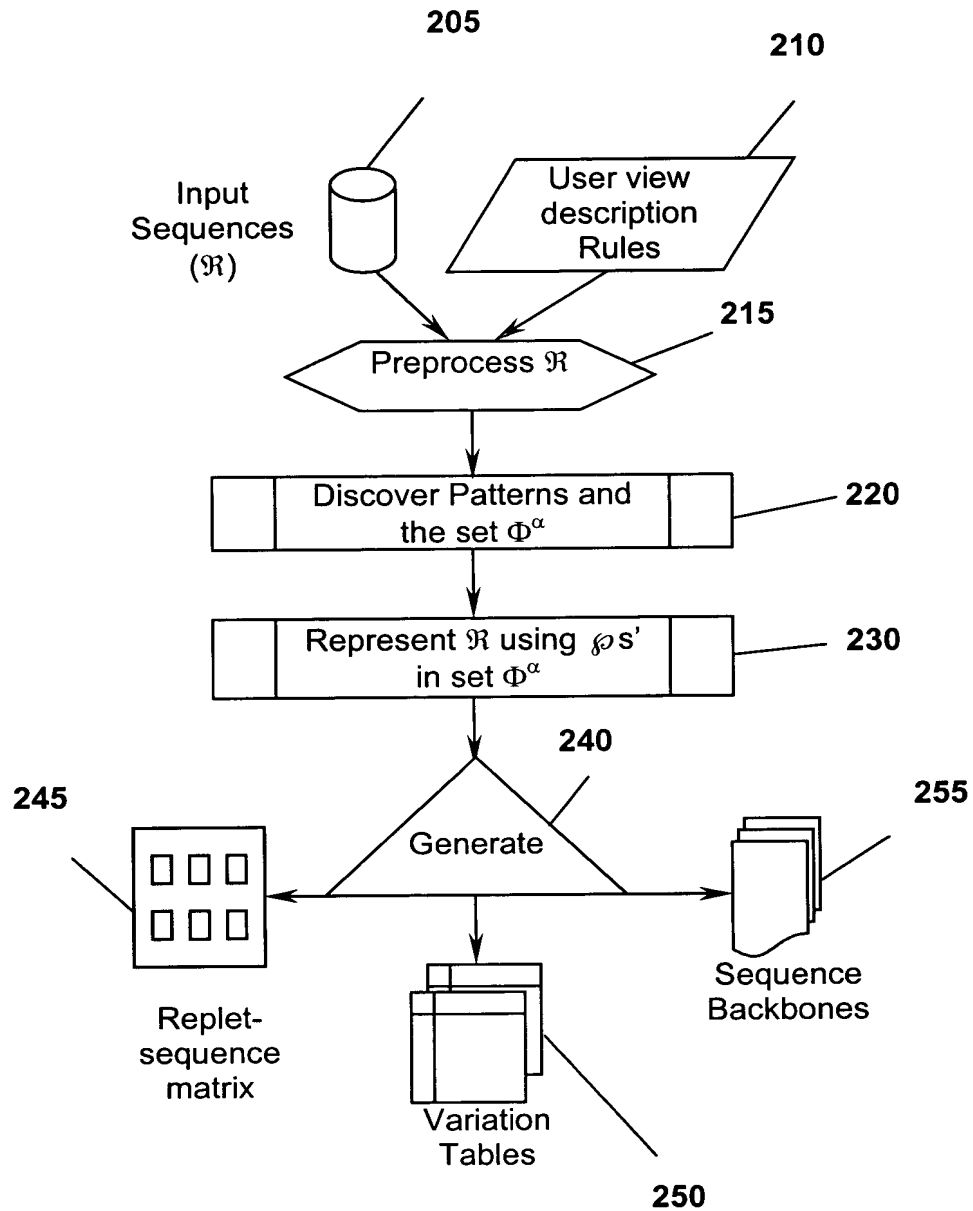


FIG. 2

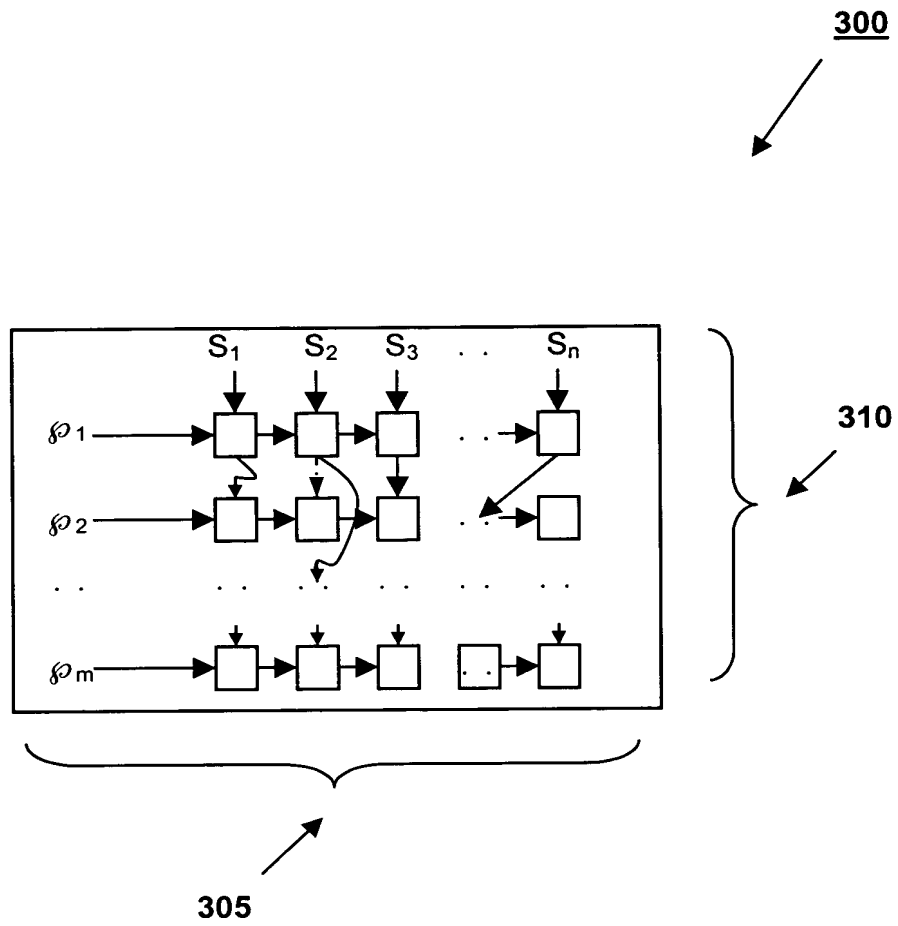
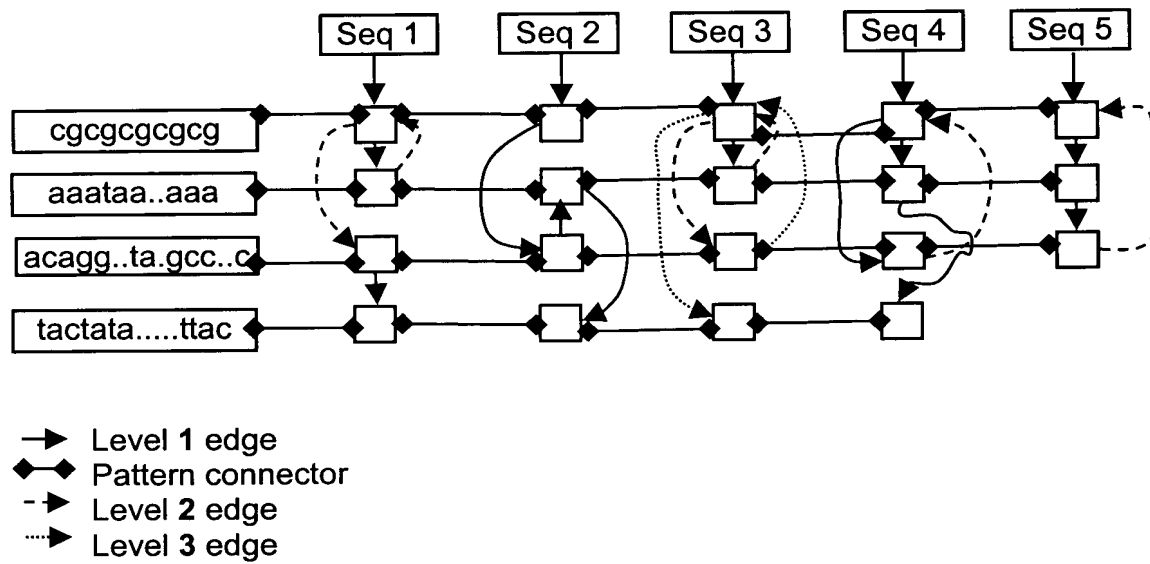


FIG. 3

400**FIG. 4**

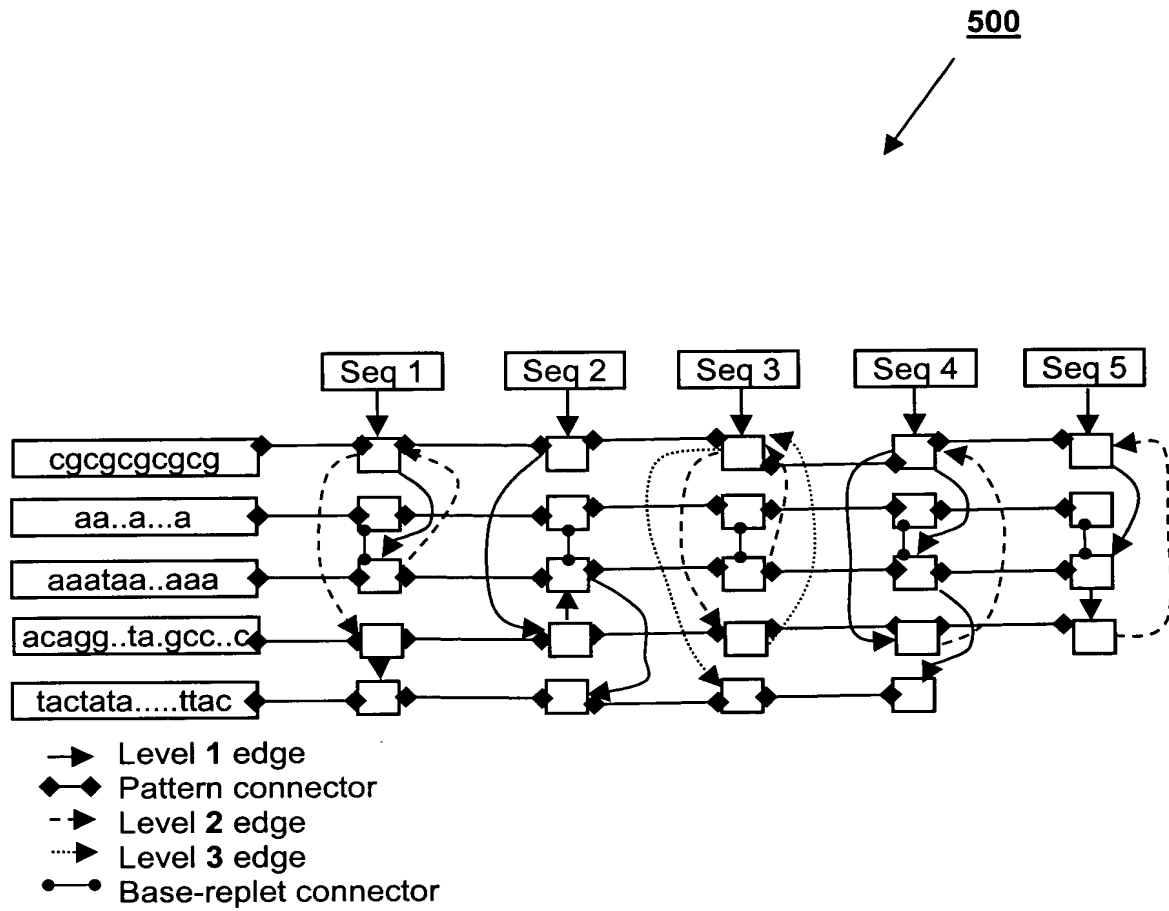


FIG. 5

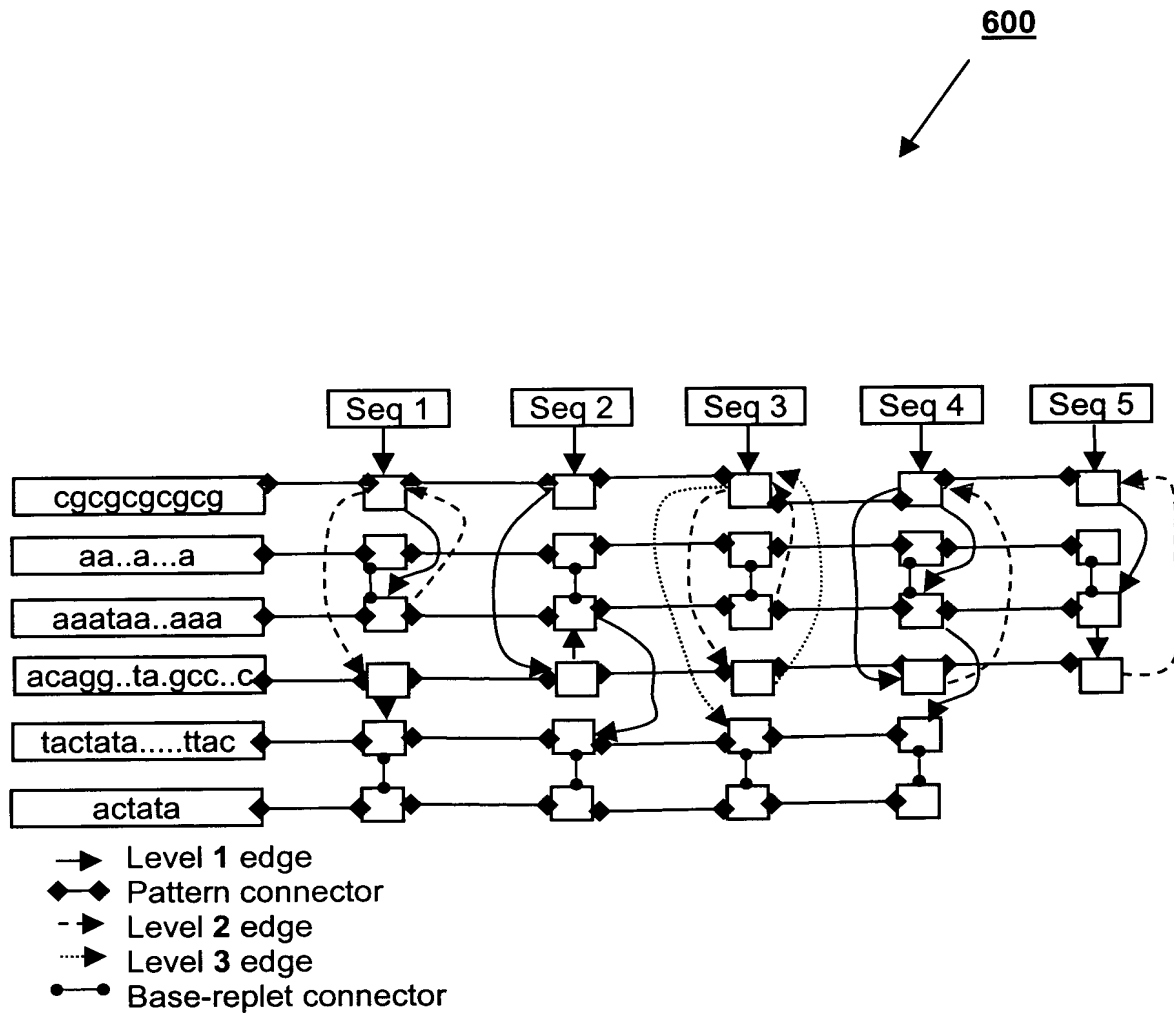


FIG. 6

Algorithm reconstruct (sequence-id seq_id)

Begin

Backbone = getBackbone(seq_id);

/ getBackbone(seq_id) searches the backbone list and returns the backbone*

corresponding to seq_id/*

Match-Set mr = getheadof(seq_id); */* returns the first match-set instance of the sequence seq_id*/*

String seq="";

offset=0;

Hashtable ht = 0;

loopcnt=0;bptr=0;

While(mr!=null){ */* 'null' represents the end of traversal*/*

 roffset = getOffset(mr, loopcnt); */* returns the loopcntth offset (k+ δ) of the instance mr*/*

 if((roffset – poffset)>0){

 seq=concat(seq, substring(backbone, bptr, roffset-poffset));

 bptr=bptr+roffset-poffset;

 }

 poffset = roffset +length(getreplet(mr)); */*getreplet(mr) returns the replet in mr*/*

 seq = concat(seq, resolve(getreplet(mr), getVarInfo(mr,roffset)));

*/*getVarInfo(mr, roffset) provides the variation information for the replete in mr at the roffset*/*

/ resolve(replet, var-info) generates the subsequence represented by replete+var-info*/*

 add(mr,ht); */* increments the occurrence count of replete in mr when traversing the sequence*/*

 loopcnt = no-of-occurance(mr, ht);

*/*no-of-occurance(mr, ht) returns the number of times the replete in mr has occurred upto this point of traversal*/*

 mr = getnextbasematchset(mr, loopcnt –1);

/ getnextbasematchset(mr, cnt) provides the next occurring base reptlets match set Instance, this corresponds to the 'cnt'th pointer in the current mr*/*

 loopcnt = no-of-occurance (mr, ht);

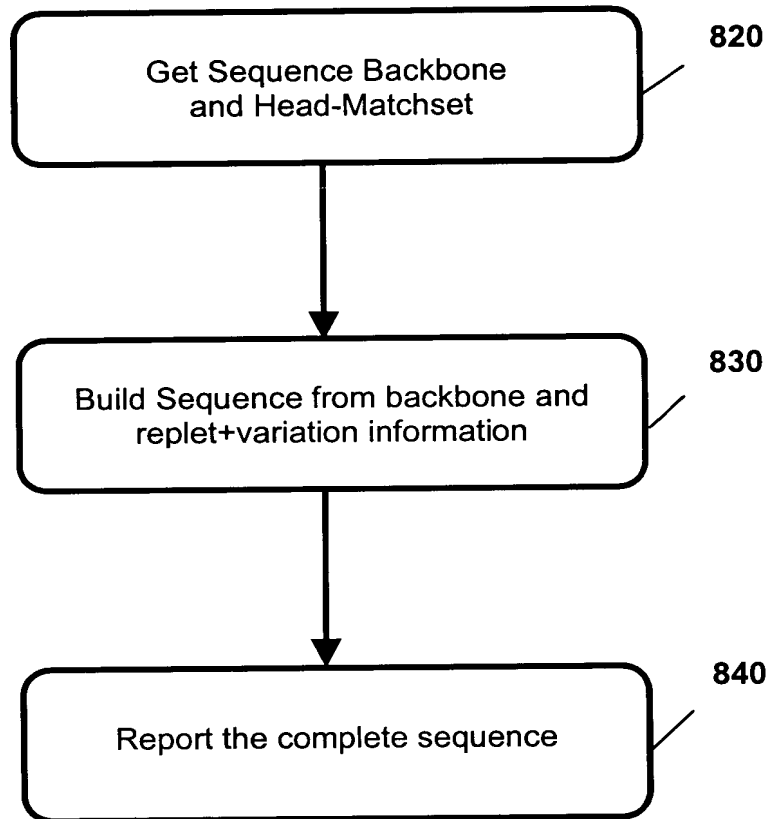
}

seq = concat(seq, substring(backbone, bptr, length(backbone)-1);

return seq;

End

FIG. 7

**FIG. 8**

Backbone = bseq 3: acttgatcggtagctagacggagaagctcccaaac

Base reptlets occurring in 3 are {cgcgcgcgcg, aaataa..aaa, acagg..ta.gcc..c, tactata.....ttac}

Match-set of the base reptlets are provided below

1: cgcgcgcgcg

```
{
Sequence-id = 3
Pattern-id = 1
Array of Matching-offsets <K,δ> = {18,39,83}
Array of Is-base-replet = {true, true, true}
Array of Pointer to Base-replet = {null, null, null}
Array of sequence-formation-edges = {2, 3, 4}
Pointer to next-pattern instance = {...}, Pointer to previous-pattern instance = {...}
}
```

2: aaataa..aaa

```
{
Sequence-id = 3
Pattern-id = 2
Array of Matching-offsets <K,δ> = {28}
Array of Is-base-replet = {true}
Array of Pointer to Base-replet = {null}
Array of sequence-formation-edges = {1}
Pointer to next-pattern instance = {...}, Pointer to previous-pattern instance = {...}
}
```

3: acagg..ta.gcc..c

```
{
Sequence-id = 3
Pattern-id = 3
Array of Matching-offsets <K,δ> = {49}
Array of Is-base-replet = {true}
Array of Pointer to Base-replet = {null}
Array of sequence-formation-edges = {1}
Pointer to next-pattern instance = {...}, Pointer to previous-pattern instance = {...}
}
```

4: tactata.....ttac

```
{
Sequence-id = 3
Pattern-id = 4
Array of Matching-offsets <K,δ> = {93}
Array of Is-base-replet = {true}
Array of Pointer to Base-replet = {null}
Array of sequence-formation-edges = {null}
Pointer to next-pattern instance = {...}, Pointer to previous-pattern instance = {...}
}
```

FIG. 9A

Start of first while loop

Bptr=0;seq="";offset=0;loopcnt=0;ht={};mr=1

Inside the loop

Roffset = 18;

Condition true -> Inside 'if'

Seq = acttgatcggtagctaga

Bptr= 18

Outside 'if'

poffset = 28

seq= acttgatcggtagctagacgcgcgcgcg

ht={<1,1>}

loopcnt=1

mr=2

loopcnt=0

Start of second loop as mr!=null

Roffset = 28

Condition false

Poffset=39

Seq=acttgatcggtagctagacgcgcgcgcgaaataattaa

ht={<1,1>,<2,1>}

loopcnt=1

mr=1

loopcnt=1

Start of third loop as mr!=null

Roffset =39

Condition false

Poffset= 49

Seq= acttgatcggtagctagacgcgcgcgcgaaataattaaacgcgcgcgcg

ht={<1,2>,<2,1>}

loopcnt=2

mr=3

loopcnt=0

Start of fourth loop as mr!=null

Roffset = 49

Condition false

Poffset=65

Seq= acttgatcggtagctagacgcgcgcgcgaaataattaaacgcgcgcgcgacaggtataggccaac

ht={<1,2>,<2,1>,<3,1>}

loopcnt=1

mr=1

loopcnt=2

FIG. 9B

Start of fifth loop as $mr \neq \text{null}$

$R_{\text{offset}} = 83$

Condition true -> Inside 'if'

$Seq =$

acttgatcggtagctagacgcgcgcgcgaaataattaaacgcgcgcgcgcacaggtataggccaaccggagaagctcccaaac

$B_{\text{ptr}} = 36$

Outside 'if'

$P_{\text{offset}} = 93$

$Seq =$

acttgatcggtagctagacgcgcgcgcgaaataattaaacgcgcgcgcgcacaggtataggccaaccggagaagctcccaaacgcgcgcgcgcgtactatatcatattac

$ht = \{ \langle 1, 3 \rangle, \langle 2, 1 \rangle, \langle 3, 1 \rangle \}$

$loopcnt = 3$

$mr = 4$

$loopcnt = 0$

Start of sixth loop as $mr \neq \text{null}$

$R_{\text{offset}} = 93$

Condition false

$P_{\text{offset}} = 93$

$Seq =$

acttgatcggtagctagacgcgcgcgcgaaataattaaacgcgcgcgcgcacaggtataggccaaccggagaagctcccaaacgcgcgcgcgcgtactatatcatattac

$ht = \{ \langle 1, 3 \rangle, \langle 2, 1 \rangle, \langle 3, 1 \rangle, \langle 4, 1 \rangle \}$

$loopcnt = 1$

$mr = \text{null}$

$loopcnt = -1$

The while loop is terminated as $mr = \text{null}$;

Outside while loop

 There is no more subsequence of the backbone to be added to 'Seq'

 Return seq

Output =

"acttgatcggtagctagacgcgcgcgcgaaataattaaacgcgcgcgcgcacaggtataggccaaccggagaagctcccaaacgcgcgcgcgcgtactatatcatattac"

FIG. 9C

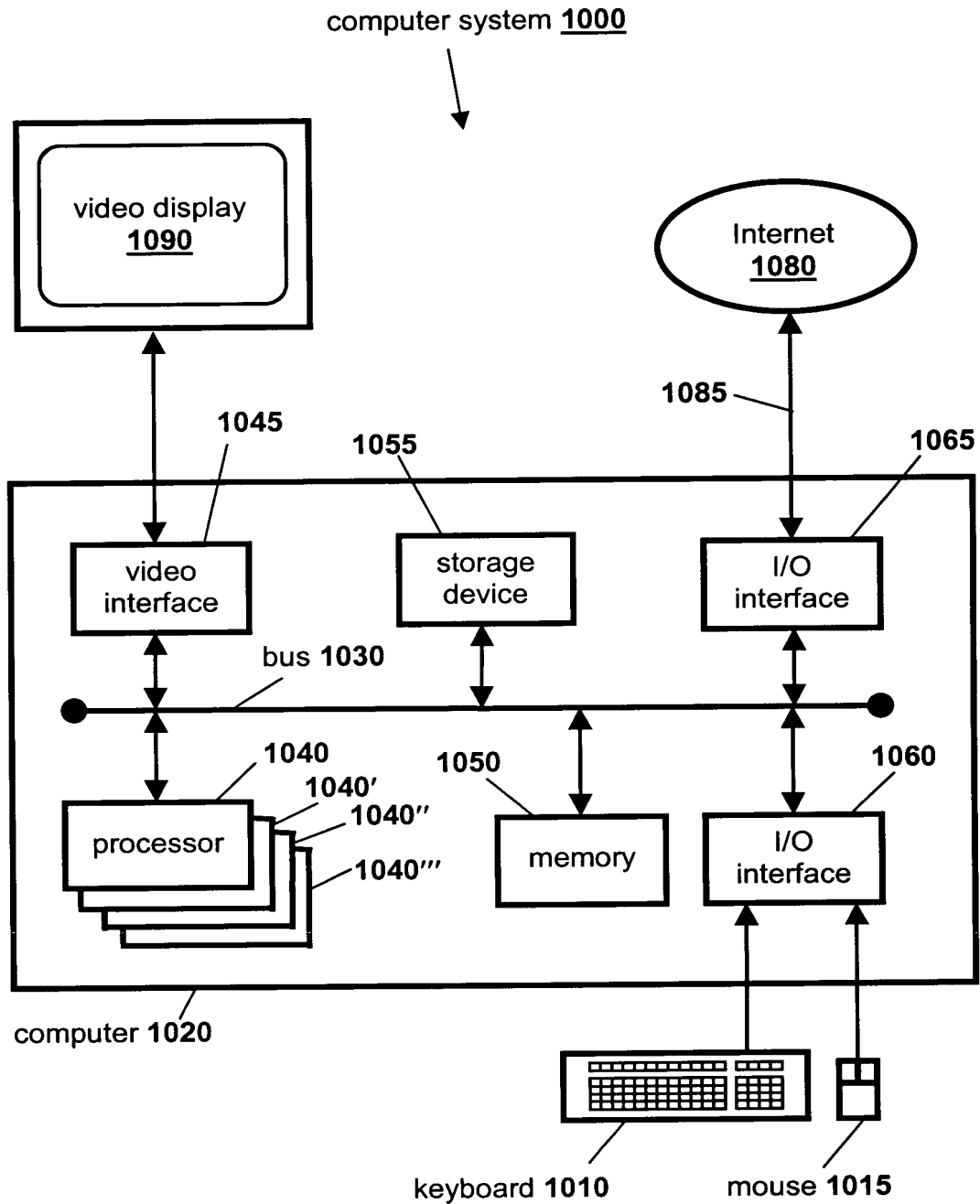


FIG. 10